The Solutions Network

Rochester, New York

UESC SUCCESS STORY
NAVSTA, GREAT LAKES, IL

IN COLLABORATION WITH COMED
(AMERESCO ENERGY SERVICES COMPANY)

Presented by
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AGENDA

- The Site: Naval Station, Great Lakes, IL
- UESC – Why & How
- 3 Step Implementation Plan
- UESC Projects
- Impact of UESC on Energy/Cost
- Impact of New Construction
- Current Utility & Cogen Projects, Phases (9a&b)
- Our Next Project
- Benefits
- Lessons Learned

THE SITE

- Naval Station, Great Lakes, IL
  - Located 35 miles North of Chicago
  - About 278 buildings
  - 10.887Million Square Feet of Occupied Space
  - Largest US Navy Recruit Training Center

UESC WHY & HOW

- REASONS FOR CONSERVATION EFFORTS
  - EPAct of 1992
  - Executive Orders: 12902,13123
  - Mandates: 30% & 35% energy use reductions by 2005 and 2010 respectfully using 1985 as base line
  - Instructions: OPNAVINST 4100-5D, NAVSTAINST 11300.1F
  - Energy Audits: Findings and Recommendations
  - Deferred facilities maintenance
  - Many energy/cost reduction opportunities

WHY UESC?

- Streamlined procurement process
- Saves time
- Flexible contracts
- Payment through utility budget appropriations
- No direct appropriations needed
- Up front financing by the utility
- Local utility willing to participate
- Relationship with a long standing utility
- One-stop shopping for a turnkey project
- Water savings projects also included
- Capital improvement helps upgrade equipment and facilities

WHY UESC?

- Financing provided by ComEd
  -Average of 10% buy down
- Repayment terms range from 10 to 15 years with annual payments
- Financing rate-spread agreed to in BOA
- Savings exceed payments by at least 10%

UESC HOW?

- **BASE WIDE ENERGY SURVEY**
  - Local Utilities were solicited in 1996 for their interest in DSM (now UESC)
  - Two companies, ComEd and North Shore Gas conducted base wide energy survey
  - ComEd proposed efficiency in the facilities and infrastructures
  - North Shore Gas proposed decentralization of the central heating plant
  - Potential for energy conservation and costs savings existed with ComEd's survey
  - North Shore's survey was shelved for further studies (mainly due to cost)

UESC HOW?

ROLES AND RESPONSIBILITIES

COMED

- Energy survey/audit
- Feasibility study
- Engr & economic analysis
- Design
- Financing
- Installation
- Warranty

GOVERNMENT

- NAVSTA –Manages
- NFESC SOUTHDIV-(Engineering & economic overview)
- EFA MW - Contracting
- EFA MW –Project management
- NETC (CNI) - Final Approval
- Comptroller – Pays up

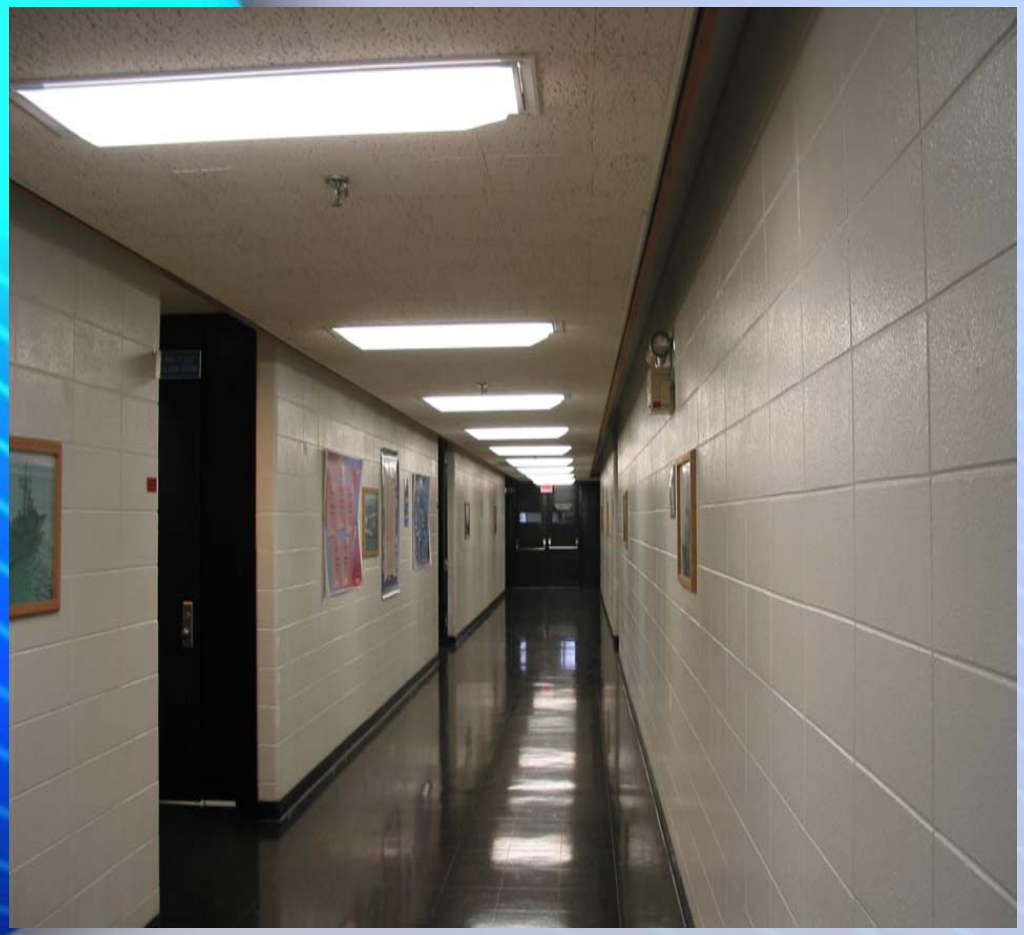
3 STEP IMPLEMENTATION PLAN

- In 1996 NAVSTA singed a UESC agreement with ComEd to implement energy and water conversation projects in 3 steps:
  - Step 1; Implement base wide facilities efficiency project and reduce water utilization and sewage production
  - Step 2; Upgrade utility distribution systems
  - Step 3; Upgrade/right-size the central plant

UESC PROJECTS

- July 1996 first major energy conservation project included energy efficiency upgrades for 6 buildings at NS, Great Lakes
- 1996-2003, 8 task orders (Phases) have been awarded to ComEd, under GSA Areawide Contract.
- Projects done include: HVAC, Direct Digital Controls (DDC), Lighting upgrade, Steam Traps, Steam line insulation, Heat Exchangers, chiller repair,Various Retrofits/Upgrades for 153 buildings.
- Phase 9 (Cogeneration Plant) Utility Distribution and Central Plant Upgrade are in construction

UESC PROJECTS



- Lighting Retrofit
- Lamp & Ballast Standardization
- Improved Lighting Quality
- LED Exit Signs

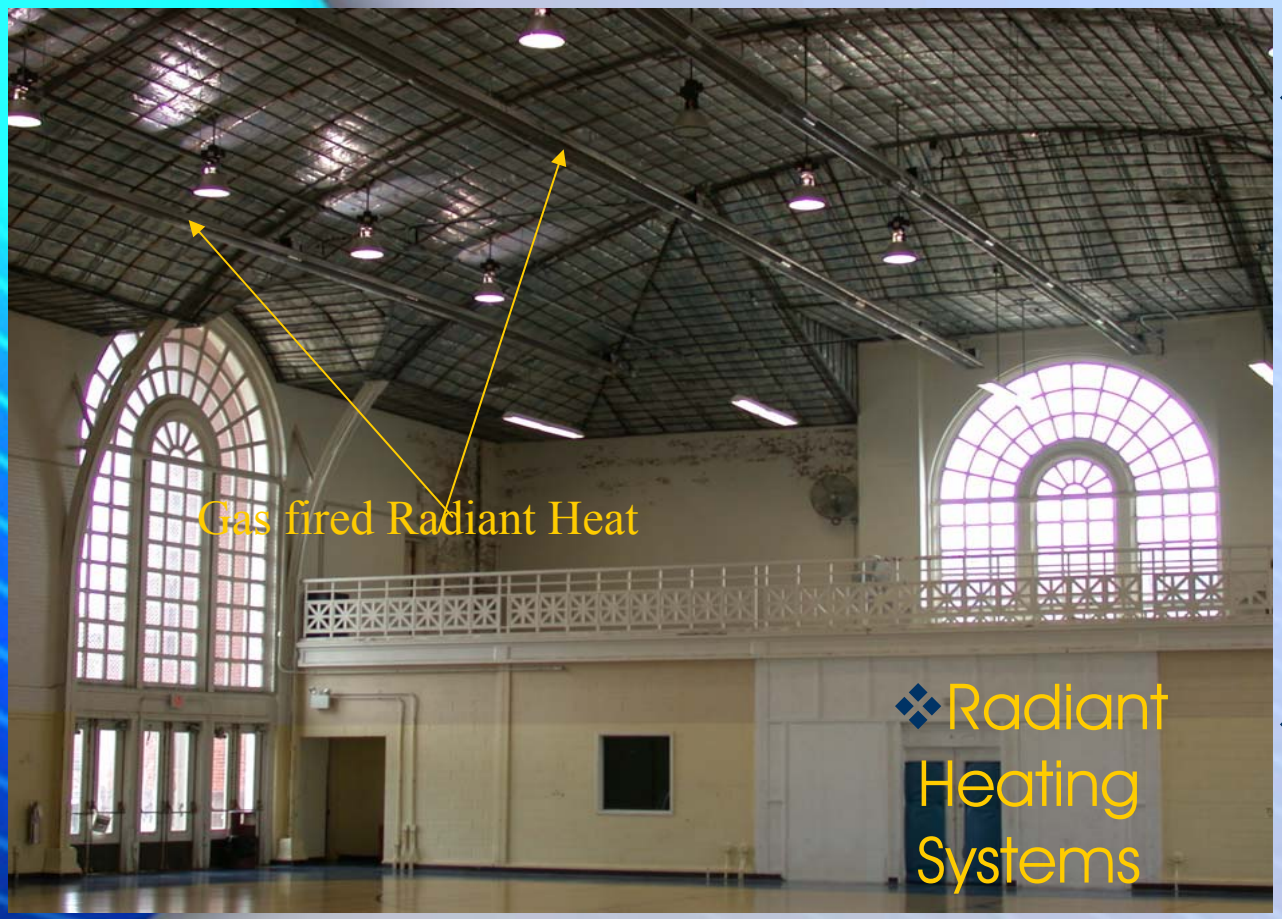
UESC PROJECTS

- Building Control Systems
- Direct Digital Control
- Pneumatic Component Repair/Replacement
- Energy Efficient Control Strategies Including:
  - Economizers
  - Optimal Start/Stop
  - Night Setback

UESC PROJECTS

- Chiller & Refrigeration System Upgrade
- Energy Efficient Chillers
- Environmentally Friendly Refrigerants
- Variable Speed Pumping
- Rack Refrigeration Systems

UESC PROJECTS



- Steam System Upgrades
  - Pipe Insulation
  - Steam Trap Testing & Replacement
  - Heat Exchanger Cleaning & Upgrades
- Radiant Heating Systems

Radiant Heating Systems

UESC PROJECTS

- Air Handling Unit Upgrades
- Roof-Top Unit Replacement
- Variable Speed Fans
- High Efficiency Motors

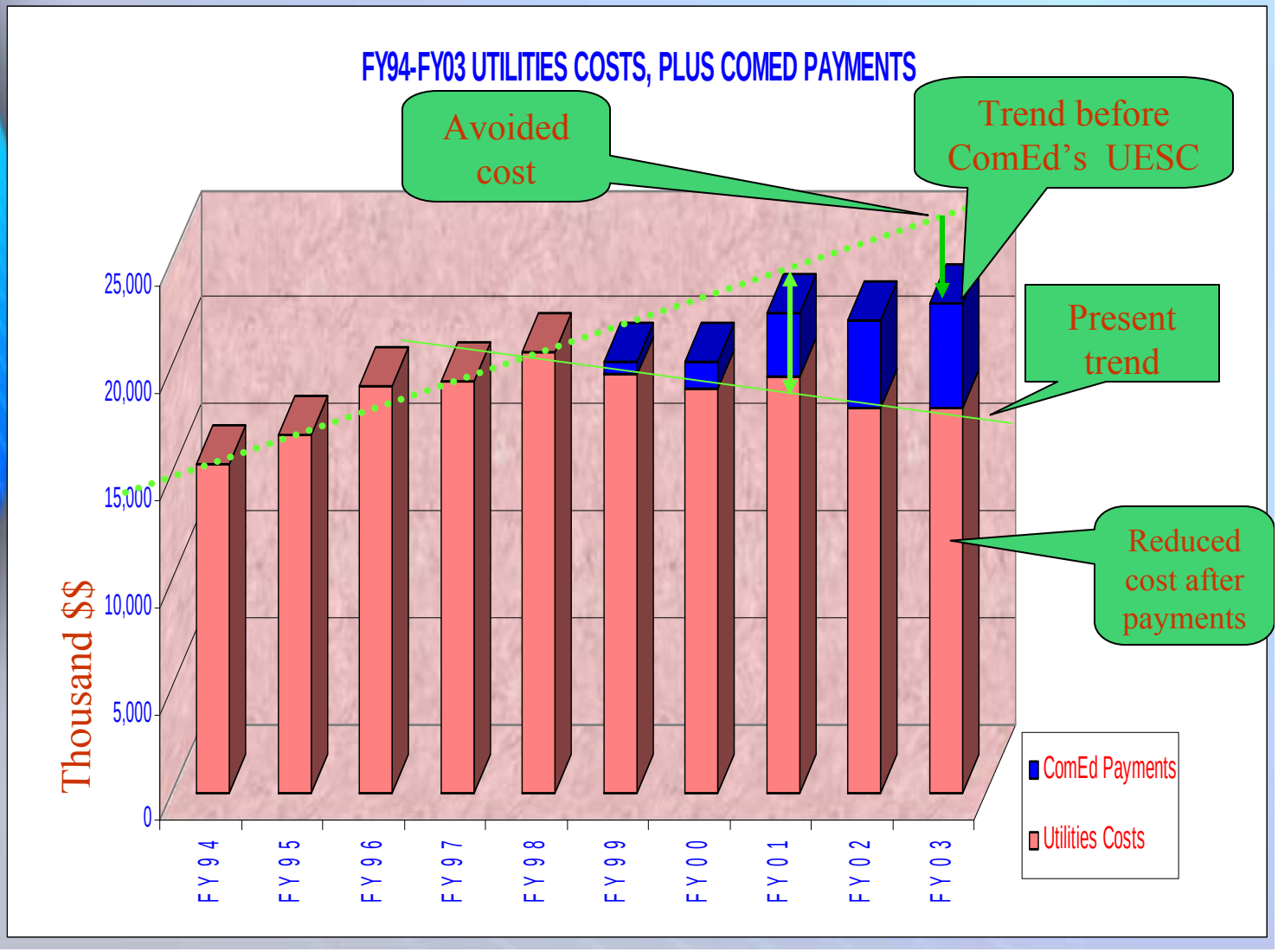
SUMMARY OF PROJECTS

- 635 Energy Conservation Measures
- 153 Buildings
- Replaced/Retrofited 63,449 Light Fixtures
- Tested 2,687 Steam Traps and Replaced 530
- 17 Buildings Converted to Variable Air Volume
- Replaced 77 AHU's/RTU's
- Replaced 13 Large Chillers
- Removed the Equivalent of 83,229 tons of CO_2, 1,226 tons of SO_2 and 439 tons of NOx per year in Illinois

SUMMARY OF PROJECTS

Great Lakes UESC Energy Conservation Projects						
Contract Date	Project	Project Completion	Energy Savings Mbtu	Installed Cost	Cost Savings	Payback
13-May-97	Phase I - 6 Bldgs	Feb-98	9,091	$1,231,014	$219,101	5.62
31-Dec-97	Hosp.Ph. A-200H	May-98	10,197	$1,767,681	$234,005	7.55
6-Feb-98	Phase II -20 Bldgs	Jan-99	71,577	$8,234,242	$1,271,242	6.48
18-Dec-98	Phase III -20 Bldgs	Dec-99	57,244	$7,591,274	$914,242	8.30
27-May-99	Phase IV -30 Bldgs	Feb-00	74,177	$8,075,733	$1,163,717	6.94
5-Jan-00	Phase V - 20 Bldgs	Dec-01	61,100	$8,668,278	$946,286	9.16
7-Aug-00	Phase VI - 20 Bldgs	Dec-01	78,375	$8,680,256	$1,187,998	7.31
15-Dec-00	Total VII -9 Bldgs	Jun-02	99,179	$7,817,703	$988,482	7.91
31-Dec-01	Phase VIII -35 Bldgs	Dec-02	55,368	$5,259,558	$746,399	7.05
Summary			516,308	$57,325,739	$7,671,471	7.47

IMPACT OF UESC COST CONTROL/REDUCTION



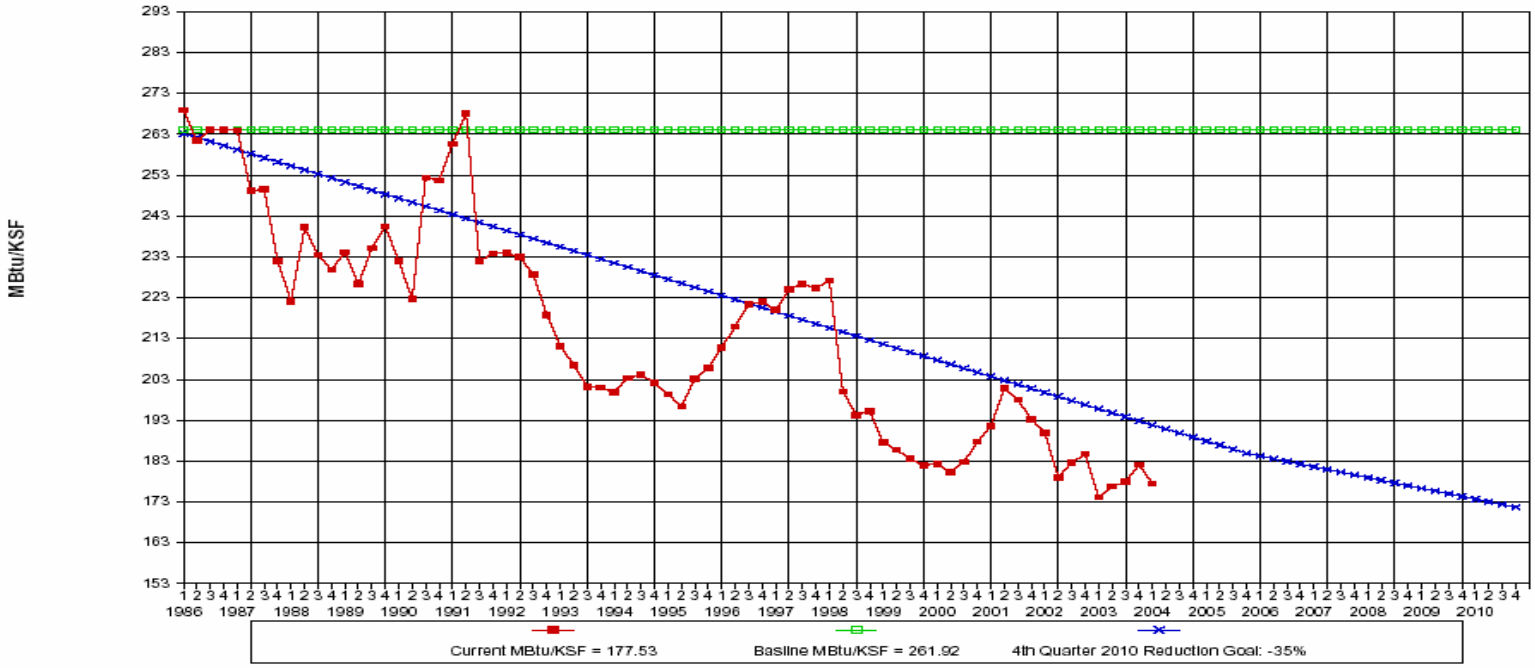
IMPACT OF UESC MEETING OUR MANDATE

NFESC Graph: EAR16
Current Progress: -32.22%

N00210 Naval Shore Activities
1st Quarter FY 2004: January 2003 through December 2003

Current Goal: -27.38%

Energy Reduction Progress



Energy Reduction Progress Graph: EAR16

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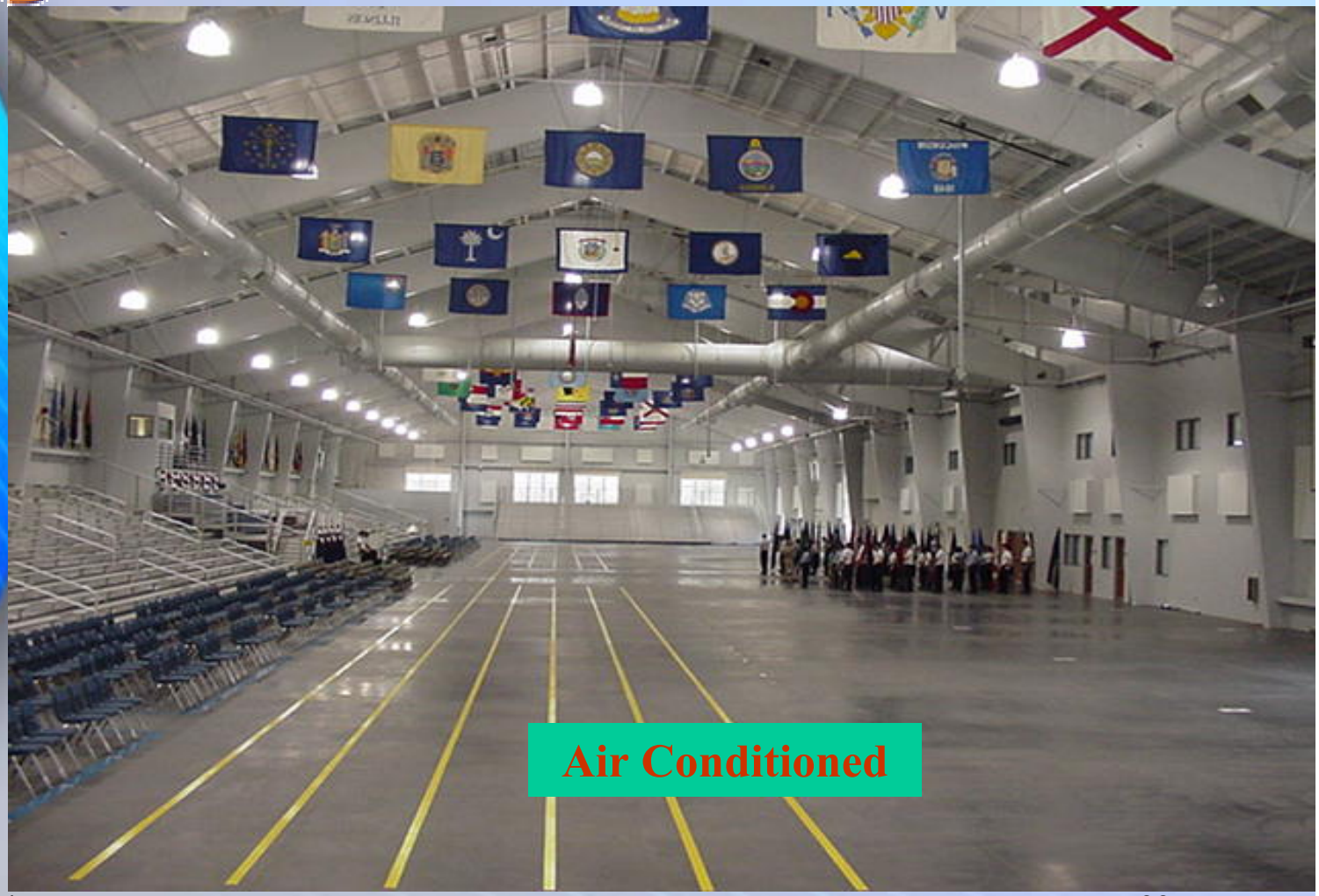
IMPACT OF NEW CONSTUCTION
(Recap) RTC Drill Hall

IMPACT OF NEW CONSTUCTION
Freedom Hall PTF

IMPACT OF NEW CONSTRUCTION RTC
Drill Hall, Showing Interior



CURRENT UTILITY & COGEN PROJECTS

- Phase 9a
  - Steam and Condensate Line Replacement
  - Boiler Fan VSD's in Central Plant
  - Network Enhancement & Boiler Controls Upgrade in Central Plant
- Phase 9b
  - Cogeneration System
  - Back Fuel Oil Conversion

CURRENT UTILITY & COGEN PROJECTS

- Replace 2 miles of steam and condensate lines
- Re-insulate steam piping

STEAM & CONDENSATE LINE REPLACEMENT

CURRENT UTILITY & COGEN PROJECTS

- Convert Make-up air flow to variable speed on Boilers #4 & #6

NETWORK ENHANCEMENT & BOILER CONTROLS UPGRADE

- Upgrade controls on Boiler #4
- Design and install network for all Central Plant controls

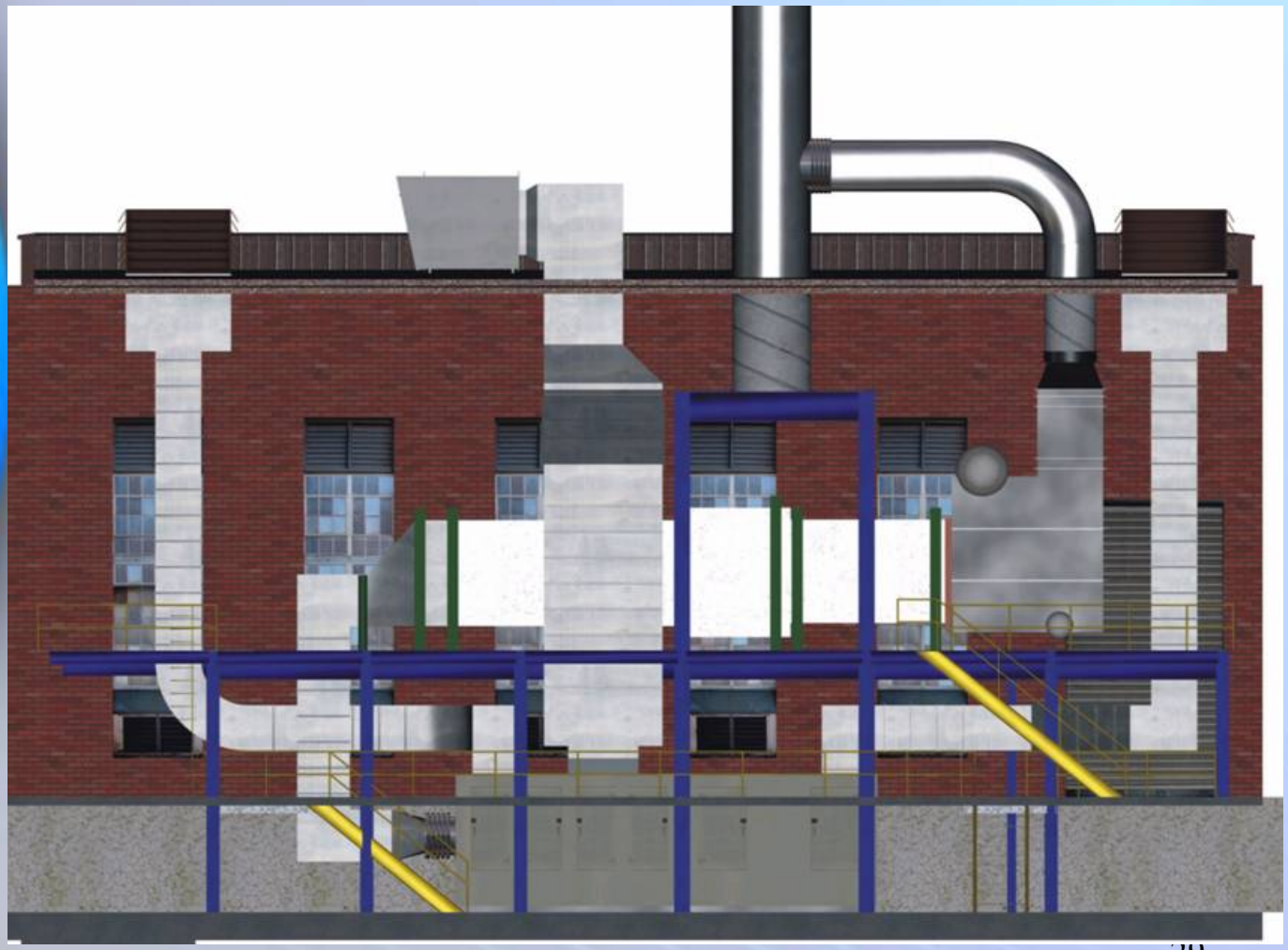
PHASE 9a
PROJECT SUMMARY

- Investment: $8,400,000
- Simple Payback: 9.4 years
- Project Completed January 04

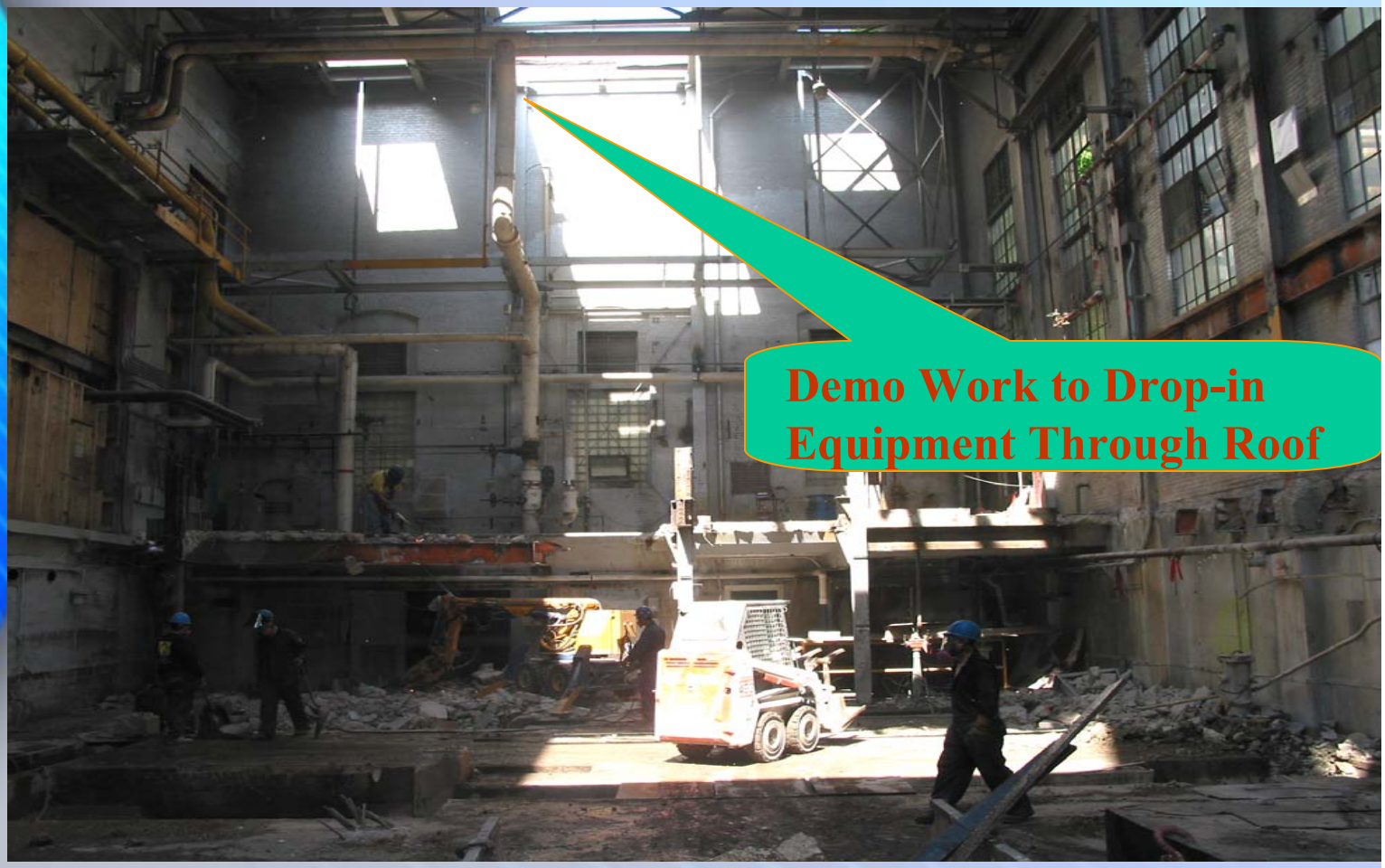
PHASE 9b
COGENERATION

- Replace three 50,000-lb/hr boiler, built in the early 40's, with two 5.5 Mw Solar gas turbines
- System includes two 26,000 lbs/hr Heat Recovery Steam Generators (HRSG's) and two 24,000 lbs/hr duct burners
- Install two 2 Mw internal combustion (IC) diesel generators for back-up
- True base load system

PHASE 9b
COGENERATION



PHASE 9b COGENERATION



PHASE 9b
FUEL OIL CONVERSION

- Replace #6 Fuel Oil with #2 Fuel Oil
- Replace fuel oil delivery system
- Clean and reuse existing fuel oil tanks

NEXT PROJECT PHAS10 IN PROGRESS

- Lighting Occupancy Sensors
- Water Conservation
- Vending Machine Miser
- HVAC Upgrades
- PV Cell Initiative
- DDC/Fiber Optic Interface
- More Lighting Upgrade

BENEFITS TO NSGL

- Meeting Federal Conservation Mandates
- Reduction in Procurement Time
- Reduction in O&M Costs While Improving Efficiencies
- Better Approach Using Comprehensive Total Solution Focus
- Upfront Financing of Improvements Provided by ComEd/Ameresco
- Improved Facilities and QOL for Students and personnel
- Doing The Right Things and Wining Awards

BENEFITS TO COMED/AMERESCO

- Federal Government Reference Site
- Additional Revenue and Profit Source
- Co-Developed A Repeatable Process
- True Partnership Arrangement

LESSONS LEARNED

- Good Partnership is Critical to the Success of the Process
- Incorporate all stakeholders early
- Stress the Importance of continued payment by reimbursable customers
- Involve Senior Management
- Be Critical from Assessment Through Implementation
- Communication
- Expediting the Procurement and Delivery Process is Possible!